

What is claimed is:

1. A network reconfiguration method for reconfiguring a network including a plurality of sub-networks each including a node operating in a master mode and at least one node operating in a slave mode and being linked with the node operating in the master mode, the network reconfiguration method comprising the steps of:

(i) causing each node to detect a linkable node:

(ii) generating detection information including a result of detection in the step (i);

(iii) with reference to the detection information generated in the step (ii), selecting a node becoming the node operating in the master mode, in such a manner as to reduce a total number of nodes operating in the master mode; and

(iv) constructing a sub-network including the node selected in the step (iii).

2. The network reconfiguration method as defined in claim 1, wherein, the step (iii) includes the sub-steps of:

(a) searching a node to which all nodes on the network are linkable;

(b) if the node to which all nodes on the network are

linkable cannot be found out in the step (a), searching a combination of nodes to any one of which all nodes on the network are linkable; and a node which is linkable to at least two nodes in the combination of the nodes;

(c) if the node linkable to said at least two nodes cannot be found out, increasing a number of nodes constituting the combination and repeating the step (b); and

(d) determining either the node found out in the step (a) or the combination of the nodes found out in the step (b) as the node(s) operating in the master mode.

3. The network reconfiguration method as defined in claim 1, wherein, the step (iv) includes a sub-step of causing a node to notify another node of a change of a link.

4. A node which is eligible to be a part of a sub-network including a node operating in a master mode and at least one node operating in a slave mode and being linked with the node operating in the master mode, and is capable of operating both in the master mode and in the slave mode, comprising:

detection means for detecting a linkable node;

storage means for storing detection information

which includes a result of detection of the node, which is obtained by the detection means, and results of detections of other nodes constituting a network including sub-networks including said sub-network;

communication means for exchanging the detection information with an outside;

master selecting means for selecting, with reference to the detection information, a node becoming the node operating in the master mode, in such a manner as to reduce a total number of nodes on the network operating in the master mode; and

construction means for constructing a sub-network by selecting a mode of the node and selecting a target node to be linked with, with reference to a selection by the master selecting means.

5. The node as defined in claim 4, wherein, the master selecting means includes:

first searching means for searching a node to which all nodes on the network are linkable;

second searching means for, if the node to which all nodes on the network are linkable cannot be found out by the first searching means, searching a combination of nodes to any one of which all nodes on the network are linkable; and a node which is linkable to at least two

nodes in the combination of the nodes;

repeating means for, if the node linkable to said at least two nodes cannot be found out by the second searching means, increasing a number of nodes constituting the combination and repeating an operation carried out by the second searching means; and

determining means for determining either the node found out by the first searching means or the combination of the nodes found out by the second searching means as the node(s) operating in the master mode.

6. The node as defined in claim 4, wherein, the construction means includes notification means for notifying an outside of an execution of a switching to establish a link with the selected target node.

7. A link change method for changing a link of a node which is eligible to be a part of a sub-network including a node operating in a master mode and at least one node operating in a slave mode and being linked with the node operating in the master mode, and is capable of operating both in the master mode and in the slave mode, the link change method comprising the steps of:

- (i) detecting a linkable node;
- (ii) receiving, from an outside, detection information

including results of detections of other nodes constituting a network including sub-networks including said sub-network;

(iii) updating the received detection information with reference to a result of detection of the node, which is obtained in the step (i);

(iv) to the outside, sending the detection information updated in the step (iii);

(v) with reference to the detection information updated in the step (iii), selecting a node becoming the node operating in the master mode, in such a manner as to reduce a total number of nodes operating in the master mode;

(vi) based on a selection in the step (v), selecting a mode of the node and selecting a target node to be linked with; and

(vii) if the target node selected in the step (vi) is different from a current target node, switching the target node.

8. A network reconfiguration program for causing a computer to execute a network reconfiguration method for reconfiguring a network including a plurality of sub-networks each including a node operating in a master mode and at least one node operating in a slave mode and

being linked with the node operating in the master mode,
the network reconfiguration method including the
steps of:

- (i) causing each node to detect a linkable node;
- (ii) generating detection information including a
result of detection in the step (i);
- (iii) with reference to the detection information
generated in the step (ii), selecting a node becoming the
node operating in the master mode, in such a manner as
to reduce a total number of nodes operating in the master
mode; and
- (iv) constructing a sub-network including the node
selected in the step (iii).

9. A link change program causing a computer to
execute a link change method for changing a link of a
node which is eligible to be a part of a sub-network
including a node operating in a master mode and at least
one node operating in a slave mode and being linked with
the node operating in the master mode, and is capable of
operating both in the master mode and in the slave mode,
the link change method including the steps of:

- (i) detecting a linkable node;
- (ii) receiving, from an outside, detection information
including results of detections of other nodes constituting

a network including sub-networks including said sub-network;

(iii) updating the received detection information with reference to a result of detection of the node, which is obtained in the step (i);

(iv) to the outside, sending the detection information updated in the step (iii);

(v) with reference to the detection information updated in the step (iii), selecting a node becoming the node operating in the master mode, in such a manner as to reduce a total number of nodes operating in the master mode;

(vi) based on a selection in the step (v), selecting a mode of the node and selecting a target node to be linked with; and

(vii) if the target node selected in the step (vi) is different from a current target node, switching the target node.

10. A computer-readable recording medium storing a network reconfiguration program for causing a computer to execute a network reconfiguration method for reconfiguring a network including a plurality of sub-networks each including a node operating in a master mode and at least one node operating in a slave mode and

being linked with the node operating in the master mode,
the network reconfiguration method including the
steps of:

- (i) causing each node to detect a linkable node;
- (ii) generating detection information including a
result of detection in the step (i);
- (iii) with reference to the detection information
generated in the step (ii), selecting a node becoming the
node operating in the master mode, in such a manner as
to reduce a total number of nodes operating in the master
mode; and
- (iv) constructing a sub-network including the node
selected in the step (iii).

11. A computer-readable recording medium storing a
link change program causing a computer to execute a link
change method for changing a link of a node which is
eligible to be a part of a sub-network including a node
operating in a master mode and at least one node
operating in a slave mode and being linked with the node
operating in the master mode, and is capable of operating
both in the master mode and in the slave mode, the link
change method including the steps of:

- (i) detecting a linkable node;
- (ii) receiving, from an outside, detection information

including results of detections of other nodes constituting a network including sub-networks including said sub-network;

(iii) updating the received detection information with reference to a result of detection of the node, which is obtained in the step (i);

(iv) to the outside, sending the detection information updated in the step (iii);

(v) with reference to the detection information updated in the step (iii), selecting a node becoming the node operating in the master mode, in such a manner as to reduce a total number of nodes operating in the master mode;

(vi) based on a selection in the step (v), selecting a mode of the node and selecting a target node to be linked with; and

(vii) if the target node selected in the step (vi) is different from a current target node, switching the target node.